



# EXCERPT FROM THE PROCEEDINGS

---

## OF THE FIRST ANNUAL ACQUISITION RESEARCH SYMPOSIUM

**USING THE SYSTEMS ENGINEERING PROCESS TO BALANCE THE  
INTERDEPENDENCE OF MISSION CAPABILITY, OPERATIONS AND  
SUPPORT COSTS AND SYSTEM UTILITY RATES—  
WHAT'S T&E'S ROLE?**

**Published: 30 September 2004**

**by**

**LTC Thom Crouch**

**2<sup>nd</sup> Annual Acquisition Research Symposium  
of the Naval Postgraduate School:**

**Charting a Course for Change:  
Acquisition Theory and Practice for a Transforming Defense**

**May 13, 2004**

Approved for public release, distribution unlimited.

Prepared for: Naval Postgraduate School, Monterey, California 93943



Report Documentation Page			Form Approved OMB No. 0704-0188		
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE <b>30 SEP 2004</b>		2. REPORT TYPE		3. DATES COVERED <b>00-00-2004 to 00-00-2004</b>	
4. TITLE AND SUBTITLE <b>Using the Systems Engineering Process to Balance the Interdependence of Mission Capability, Operations and Support Costs and System Utility Rates - What's T&amp;E's Role?</b>			5a. CONTRACT NUMBER		
			5b. GRANT NUMBER		
			5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S)			5d. PROJECT NUMBER		
			5e. TASK NUMBER		
			5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) <b>Naval Postgraduate School, Graduate School of Business and Public Policy, 555 Dyer Road, Room 332, Monterey, CA, 93943</b>			8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSOR/MONITOR'S ACRONYM(S)		
			11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION/AVAILABILITY STATEMENT <b>Approved for public release; distribution unlimited</b>					
13. SUPPLEMENTARY NOTES <b>1st Annual Acquisition Research Symposium: Charting a Course for Change: Acquisition Theory and Practice for a Transforming Defense, 13 May 2004 in Monterey, CA</b>					
14. ABSTRACT <b>see report</b>					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT <b>Same as Report (SAR)</b>	18. NUMBER OF PAGES <b>12</b>	19a. NAME OF RESPONSIBLE PERSON
a. REPORT <b>unclassified</b>	b. ABSTRACT <b>unclassified</b>	c. THIS PAGE <b>unclassified</b>			

The research presented at the symposium was supported by the Acquisition Chair of the Graduate School of Business & Public Policy at the Naval Postgraduate School.

**To request Defense Acquisition Research or to become a research sponsor, please contact:**

NPS Acquisition Research Program  
Attn: James B. Greene, RADM, USN, (Ret)  
Acquisition Chair  
Graduate School of Business and Public Policy  
Naval Postgraduate School  
555 Dyer Road, Room 332  
Monterey, CA 93943-5103  
Tel: (831) 656-2092  
Fax: (831) 656-2253  
E-mail: [jbgreene@nps.edu](mailto:jbgreene@nps.edu)

Copies of the Acquisition Sponsored Research Reports may be printed from our website [www.acquisitionresearch.org](http://www.acquisitionresearch.org)

Conference Website:  
[www.researchsymposium.org](http://www.researchsymposium.org)



ACQUISITION RESEARCH PROGRAM  
GRADUATE SCHOOL OF BUSINESS & PUBLIC POLICY  
NAVAL POSTGRADUATE SCHOOL

## Proceedings of the Annual Acquisition Research Program

The following article is taken as an excerpt from the proceedings of the annual Acquisition Research Program. This annual event showcases the research projects funded through the Acquisition Research Program at the Graduate School of Business and Public Policy at the Naval Postgraduate School. Featuring keynote speakers, plenary panels, multiple panel sessions, a student research poster show and social events, the Annual Acquisition Research Symposium offers a candid environment where high-ranking Department of Defense (DoD) officials, industry officials, accomplished faculty and military students are encouraged to collaborate on finding applicable solutions to the challenges facing acquisition policies and processes within the DoD today. By jointly and publicly questioning the norms of industry and academia, the resulting research benefits from myriad perspectives and collaborations which can identify better solutions and practices in acquisition, contract, financial, logistics and program management.

For further information regarding the Acquisition Research Program, electronic copies of additional research, or to learn more about becoming a sponsor, please visit our program website at:

[www.acquisitionresearch.org](http://www.acquisitionresearch.org)

For further information on or to register for the next Acquisition Research Symposium during the third week of May, please visit our conference website at:

[www.researchsymposium.org](http://www.researchsymposium.org)



THIS PAGE INTENTIONALLY LEFT BLANK



# Using the Systems Engineering Process to Balance the Interdependence of Mission Capability, Operations and Support Costs, and System Utility Rates—What's T&E's Role?

---

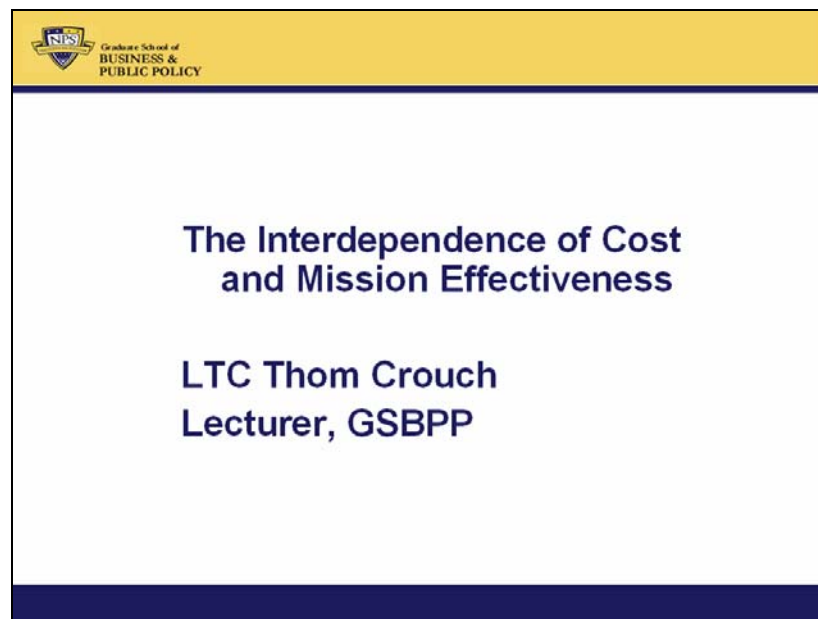
**Presenter: LTC Thom Crouch**, Lecturer, Graduate School of Business & Public Policy, Naval Postgraduate School

---

## Abstract

This research project defines the interdependent relationship between a weapon system's mission capabilities, O&S costs, operational utility rate, and their impacts on overall mission effectiveness of an operational combat unit. By analyzing the sub-elements of both operational effectiveness and operational suitability it can be shown how operational effectiveness is a dependent element of operation suitability. Additionally, it will be demonstrated how support costs influence operational suitability parameters of a weapon system, which then impacts a combat unit's overall mission effectiveness. Since support costs have such a critical relationship with operational suitability factors, the project also defines the current relationships between Service Cost and T&E communities to question whether or not there is the requisite level of integration of effort between the two organizations to accurately assess weapon system costs and capability prior to production.

## Introduction



## MISSION EFFECTIVENESS DRIVERS

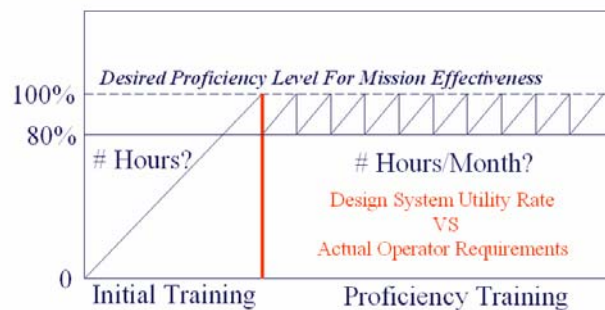
Full Mission Effectiveness (ME) is a function of  
BOTH:

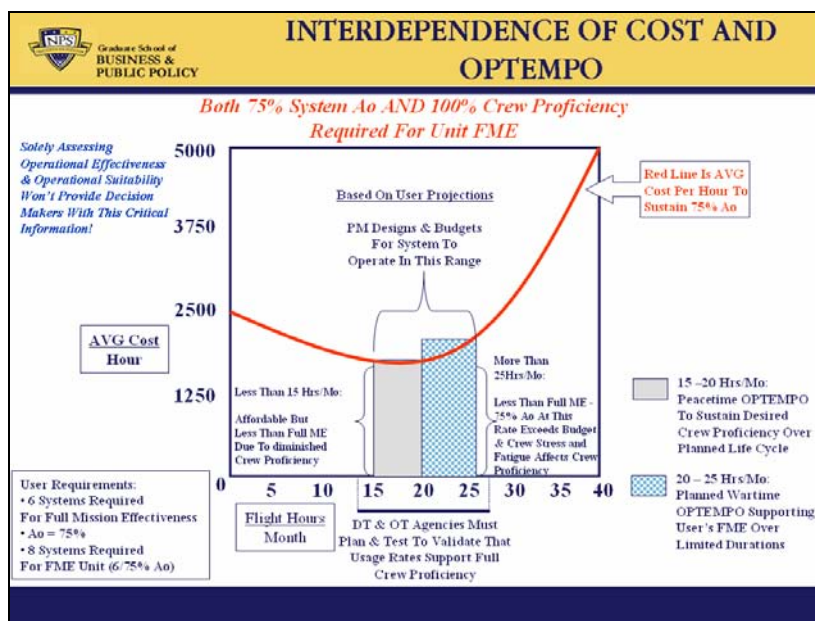
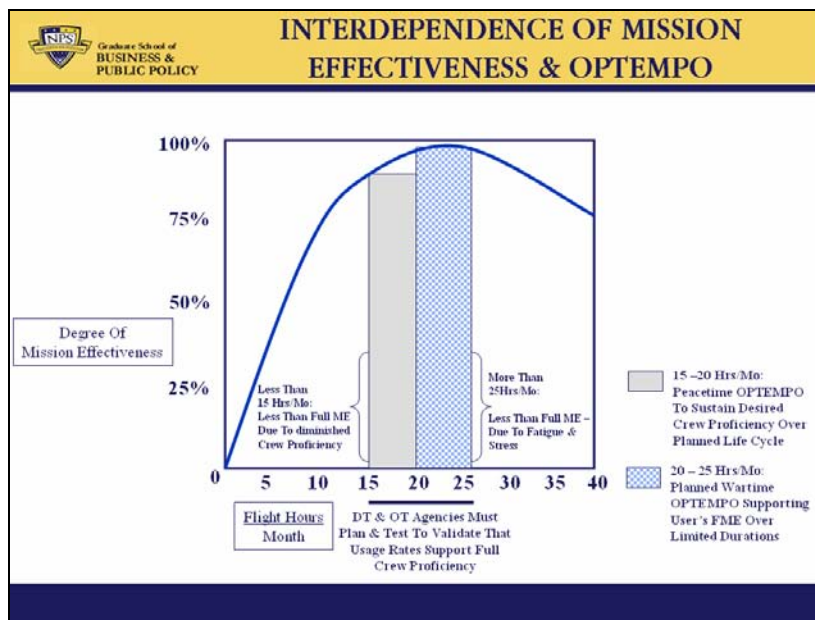
1. Collective crew proficiency to perform requisite mission tasks
2. Collective weapon system readiness and capability at the unit of action level

In current terms – At the unit of action level, weapon systems must be both operationally effective and suitable (in both peace & wartime OPTEMPO) with particular attention to whether or not system readiness levels support crew proficiency.

## TRAINING REQUIREMENTS

How do training requirements compare to the design utility rate of the weapon system?







## SUMMARY

- T&E communities can contribute significantly to defining and assessing requisite OPTEMPO rates for new systems
- Collecting data to define the shape of a system's operational cost curve can be most insightful in predicting O&S costs
- Close relationship between Cost and T&E communities a must to obtain total projected O&S impacts

THIS PAGE INTENTIONALLY LEFT BLANK



## 2003 - 2006 Sponsored Acquisition Research Topics

### **Acquisition Management**

- Software Requirements for OA
- Managing Services Supply Chain
- Acquiring Combat Capability via Public-Private Partnerships (PPPs)
- Knowledge Value Added (KVA) + Real Options (RO) Applied to Shipyard Planning Processes
- Portfolio Optimization via KVA + RO
- MOSA Contracting Implications
- Strategy for Defense Acquisition Research
- Spiral Development
- BCA: Contractor vs. Organic Growth

### **Contract Management**

- USAF IT Commodity Council
- Contractors in 21st Century Combat Zone
- Joint Contingency Contracting
- Navy Contract Writing Guide
- Commodity Sourcing Strategies
- Past Performance in Source Selection
- USMC Contingency Contracting
- Transforming DoD Contract Closeout
- Model for Optimizing Contingency Contracting Planning and Execution

### **Financial Management**

- PPPs and Government Financing
- Energy Saving Contracts/DoD Mobile Assets
- Capital Budgeting for DoD
- Financing DoD Budget via PPPs
- ROI of Information Warfare Systems
- Acquisitions via leasing: MPS case
- Special Termination Liability in MDAPs

### **Logistics Management**

- R-TOC Aegis Microwave Power Tubes



- Privatization-NOSL/NAWCI
- Army LOG MOD
- PBL (4)
- Contractors Supporting Military Operations
- RFID (4)
- Strategic Sourcing
- ASDS Product Support Analysis
- Analysis of LAV Depot Maintenance
- Diffusion/Variability on Vendor Performance Evaluation
- Optimizing CIWS Life Cycle Support (LCS)

### **Program Management**

- Building Collaborative Capacity
- Knowledge, Responsibilities and Decision Rights in MDAPs
- KVA Applied to Aegis and SSDS
- Business Process Reengineering (BPR) for LCS Mission Module Acquisition
- Terminating Your Own Program
- Collaborative IT Tools Leveraging Competence

A complete listing and electronic copies of published research within the Acquisition Research Program are available on our website: [www.acquisitionresearch.org](http://www.acquisitionresearch.org)





ACQUISITION RESEARCH PROGRAM  
GRADUATE SCHOOL OF BUSINESS & PUBLIC POLICY  
NAVAL POSTGRADUATE SCHOOL  
555 DYER ROAD, INGERSOLL HALL  
MONTEREY, CALIFORNIA 93943

[www.acquisitionresearch.org](http://www.acquisitionresearch.org)